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THE IMPLEMENTATION USING SCIENCE TEACHING AIDS TO INCREASE STUDENTS LEARNING OUTCOME ON D PHASE SOLAR SYSTEM TOPIC ON SMP KARTIKA 1-7

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Abstract

This study aims to improve the learning outcomes of junior high school students using Science Teaching Aids media on the Topic D Phase Solar System. This research is a classroom action research consisting of 2 cycles. Each cycle that is run consists of the stages of Planning, Acting, Observing, and Reflecting. From the results of research regarding the application of learning media using teaching aids to improve the learning outcomes of students in Phase D Science material on the Solar System using teaching aids. which was held at SMP Kartika 1-7 Padang. This research has the aim that the use of teaching aids in this research can successfully improve students' learning outcomes in science material about the Solar System in class VII. 2 SMP Kartika 1 – 7 Padang. In cycle I, meeting 1, 24% of students achieved a minimum score of 80. In cycle II, meeting 1, the percentage of students who achieved a minimum score of 80 was 36%.

Keywords: teaching, aids, solar, system, outcomes.

Introduction

Education is an effort made to prepare students to be able to play their role in the future as quality human development. Schools are the first formal educational institutions that are very important in determining the success of student learning. The success of student learning as an indicator of improving the quality of education continues to be pursued by the government in various ways, for example curriculum development, improving teacher qualifications, improving the quality of the learning process (R. Hariyanti & S. Amin 2021). Because of that, education is the main means to prepare students to be able to play a role in quality development in the future. Schools, as the first formal educational institution, have a crucial role in determining the success of student learning. This learning success is the main benchmark in the government's efforts to improve the quality of education. To achieve this goal, the government continues to strive to develop a relevant curriculum, improve teacher qualifications, and improve the quality of the learning process as a whole. All of these efforts aim to create an educational environment that supports the optimal development of students so that they can take part in society with good competence and independence.

According to Law No. 20 of 2003, Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have spiritual religious strength, self-control, personality, intelligence, noble morals, and the skills needed by themselves, society, nation and state. Therefore, good education is education that produces children of the nation who also have good character. So that education has a role and function that is quite important for human life, both education in cognitive, affective (attitude, and psychomotor aspects). The purpose of this education is so that students have spiritual religious strength, self-control, personality, intelligence, noble morals, and the skills needed for themselves, society, nation, and state (Riastuti & Febrianti, 2021).

In the learning process, the role of teachers is very important in creating an effective and enjoyable learning environment. One important aspect in learning is the use of appropriate learning media, especially in the subject of Natural Sciences (IPA) which discusses natural phenomena, including the Solar System. Natural Sciences (IPA) is one of the subjects that has been taught since elementary school. Science learning in schools is oriented towards providing direct experience through the use and development of science skills and scientific attitudes (Maharani et al., 2017). The use of teaching aids in the learning process so that students can visualize and describe complex processes to make them easier to understand (Harahap, 2019). Science learning is a visual subject that always involves a complex sequence of events. One of the ways or guidelines in supporting the development of knowledge, skills, basic needs for delivering science materials, concepts and information by educators is through the use of teaching aids (Widayanti & Yuberti, 2018).

The learning media that is currently often used in teaching and learning activities is by using books. However, this learning media is considered not effective enough to be able to convey material, especially complex material such as the solar system. The use of still images available in textbooks makes students tend to be passive and less interactive because the image media is unable to provide a reciprocal response, less real and interesting. In fact, in the learning process of biology and physics material on the solar system, students also need to understand the form of the member planets of the solar system. In addition, students can also understand the specifications of each planet such as mass, volume, satellites, rotational speed, and so on. (Yusniawati, Ika. 2020). In this case, the use of appropriate learning media, especially in science subjects such as the Solar System, is very important to create an effective and interesting learning environment for

students, namely with the presence of teaching aids.

Teaching aids are all or everything that can be used and can be utilized to explain learning concepts from abstract or unclear material to become real and clear so that it can stimulate the thoughts, feelings, attention, and interests of students that lead to the teaching and learning process which plays a major role as a supporter of teaching and learning activities carried out by teachers or instructors. The use of these teaching aids has the aim of providing a real form to the material being studied or taught (Tuanakotta et al, 2024).

Teaching aids therefore have an important role in the learning process to change abstract or unclear concepts into more real and clear for students. The use of these teaching aids aims to stimulate students' thoughts, feelings, attention, and interest in learning. Teaching aids allow teachers to explain material in a more concrete and visual way, making it easier for students to understand and apply the concepts they are learning. Thus, teaching aids can act as an effective support in teaching and learning activities, helping to improve understanding and active involvement in the learning process. The application of learning media using teaching aids has several stages, namely action planning, action implementation, action observation, and reflection.

Research Method

This study uses Classroom Action Research. This research is a Classroom Action Research, so the method used in this study is descriptive analysis of the results of this Classroom Action Research (CAR), namely a study used to collect data, describe, process, analyze, interpret and conclude data so that a systematic picture is obtained. This research was conducted in Class VII. 2 Semester II SMP Kartika 1-7 Padang. The subjects of this study were students consisting of 25 students and consisting of 10 male students and 15 female students with an average age of 13 - 15 years.

This research was conducted using two cycles, with each cycle held 1 meeting. This research was conducted for six months, namely from January to June 2024.

The research procedures for each stage are as follows:

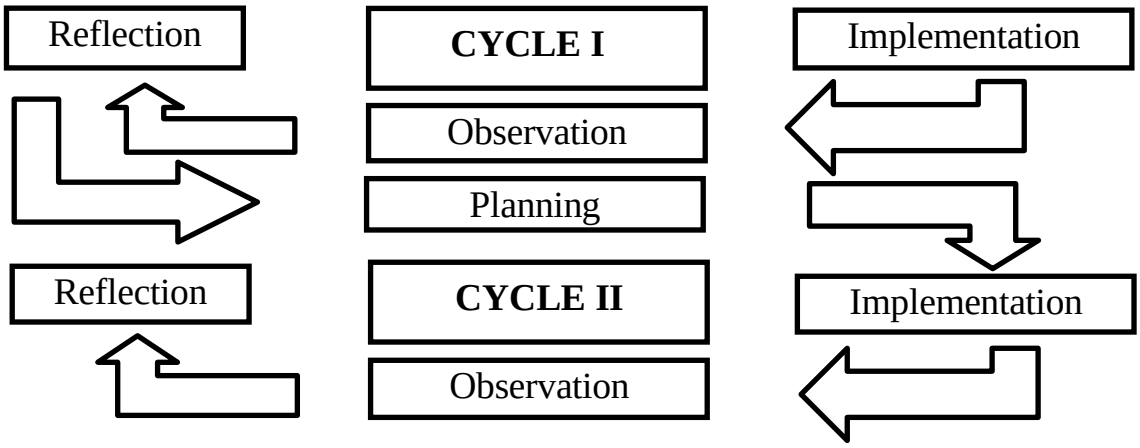

Figure 1. Action Research Stages, (Suharsimi Arikunto, 2010)

There are two learning instruments used in this study, namely:

a. Learning implementation instruments

In this study, the learning implementation instruments used were in the form of a syllabus and learning implementation plan (RPP).

b. Data collection instruments

In this study, the data obtained were collected in several ways:

1) Documentation

The documentation used in this study is in the form of student data, student activity and data on students' daily test scores that the researcher obtained from initial observations.

2) Observation

Observation by observation includes the activity of loading attention to an object using all senses (direct observation). The purpose of this observation is to determine the level of student activity in following the teaching and learning process in the classroom.

3) Evaluation test at the end of each cycle

A test is a series of questions or exercises or tools used to measure skills, knowledge, intelligence, abilities or talents possessed by individuals or groups. In this study, an achievement test was used to measure a person's achievement after studying something. The test instrument was designed to determine the extent of students' understanding in mastering the material that has been presented. This test is in the form of multiple choices and is given to obtain data on academic achievement in each cycle. This test contains the materials that have been discussed and this test will be given at the end of the cycle, then analyzed quantitatively.

Result and Discussion

CYCLE I

Based on the results of the cycle I research, the following points can be described. A total of 6 students who got an average score above the Minimum Completion Criteria (KKM) with the complete category can learn science subjects with the Solar System material. A total of 19 students who got an average score below the Minimum Completion Criteria (KKM). The number of students who had not completed the Solar System material made the researcher design cycle I using a Miniature Solar System teaching aid. In this activity, students observed the location of the planets in the solar system according to orbit, learned the characteristics of the planets in the solar system. After that, students observed the impact of the Earth's rotation, namely the occurrence of day and night in the northern and southern states of the Earth as seen on the globe. In cycle I meeting 1, students worked on a posttest on the material on the characteristics of the planets in the solar system.

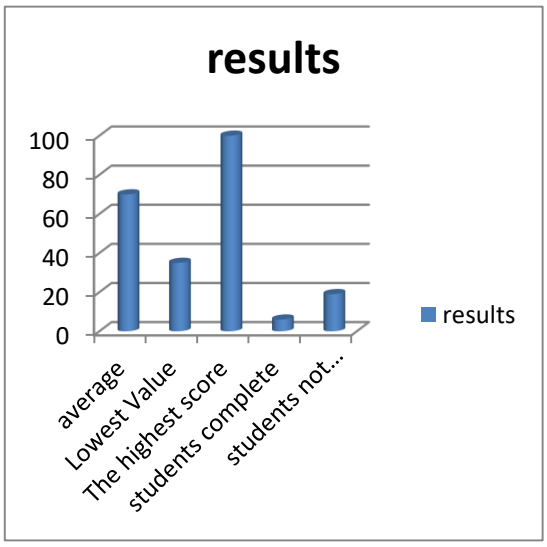

Figure 2. Cycle I

The average science learning outcomes in cycle I meeting 1 were 70.16. In cycle I meeting 1, 6 out of 25 students had achieved a minimum score of 80. The percentage of student completion was 24% and the percentage of incomplete was 76%. Many of these low scores occurred because students when given the Solar System demonstration tools were still not focused when the teacher demonstrated the demonstration tools and explained the material in class. In addition, students were also divided into groups according to their learning readiness from the assessment results. Groups 1 and 2 contained students with high to moderate learning readiness.

Meanwhile, groups 3 and 4 contained students with moderate to low learning readiness. The LKPD given had the same objectives and content. However, the teacher gave more instructions on the LKPD for groups with moderate to low learning readiness. The instructions were the definition of the solar system, the characteristics of the earth and the characteristics of the moon observed through miniature demonstration tools. The goal was to make it easier for students with moderate to low learning readiness to observe the characteristics of the earth and the characteristics of the moon.

Things that have been according to plan in cycle I are the results of learning science material Solar System students have reached a minimum score of 80, the highest average score is 100 and the lowest average score is 35. Then the division of groups has been carried out since the beginning of the 2nd semester learning and has also been carried out well. However, there are shortcomings in the implementation of cycle I, namely the lack of readiness of students in implementing learning, even though the material has been explained by demonstrating the Solar System teaching aids. The solution to this problem is that researchers should prepare their learning media more by using more complete Solar System teaching aids so that students in each group are ready and focused on learning readiness at SMP Kartika 1 - 7 Padang.

CYCLE II

In the second meeting of cycle II, students were given assessment questions about Solar Eclipse, Lunar Eclipse, Moon Phase, Revolution, Rotation of the Moon and Earth, and the Calendar System. Activities in the meeting included observing the positions of the Sun, Earth, and Moon using teaching aids during a total or partial solar eclipse. After that, students took a posttest on Solar Eclipse, Lunar Eclipse, Moon Phase, Revolution, Rotation of the Moon and Earth, and the Calendar System.

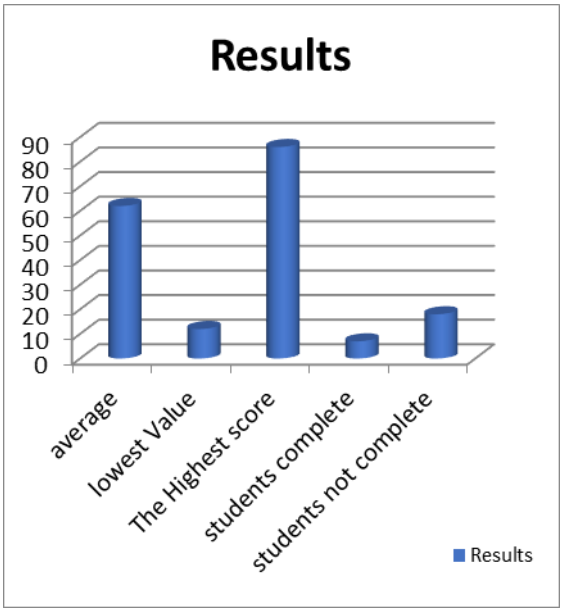

Figure 3. Cycle II

The average science learning outcomes in cycle II, meeting 1 experienced a significant decrease in the average completion rate and a slight increase compared to cycle I, which was 62.04. In cycle II, meeting I, 7 out of 25 students had achieved a minimum score of 80. The percentage of student completion at meeting 1 was 36% and the percentage of incomplete was 30%. This increase occurred because students paid attention to teaching aids in the form of pictures attached as the sun, earth, and other planets as well as styrofoam materials to support the sun and other planets, and to show the orbital lines of the solar system. These teaching aids help demonstrate to students the position of the sun, moon, and earth during an eclipse. For example, when a solar eclipse occurs, this tool shows how the moon's shadow covers part or all of the sun's surface because of the relative position between the three celestial bodies. "In addition, students are also divided into groups according to their learning readiness from the results of the posttest assessment. Groups 1, 2 and 3 contain students with high to moderate learning readiness. Meanwhile, groups 3 and 4 contain students with moderate to low learning readiness. The posttest assessment given has the same purpose and content. However, the teacher provides more instructions on the posttest assessment for

groups with moderate to low learning readiness. The instructions explain what is meant by umbra and penumbra, as well as the relative position of the Earth and the Moon during a solar or lunar eclipse.

The things that have been according to plan in cycle II are the results of learning science on the Solar System material, students have achieved a minimum score of 80, the highest average score is 86 and the lowest average score is 12. In cycle II meeting 1, the percentage of student completion reached 35% which achieved the set completion criteria, this indicates that this research was ended after two cycles.

Conclusion

The use of teaching aids in this study was able to successfully improve students' learning outcomes in science material about the Solar System in class VII. 2 SMP Kartika 1 - 7. In cycle I meeting 1, 24% of students achieved a minimum score of 80. In cycle II meeting 1, the percentage of students who achieved a minimum score of 80 was 36% respectively.

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